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SERVICE BULLETIN

No. 181
Date: 02/22/90
H. Phillips

SUBJECT: Ferrite Ring Installation For Noise Suppression
EQUIPMENT AFFECTED: 62-xxx Analyzers and 13-1xx Optional Scopes
ACTION REQUIRED: MANDATORY !! Install On Problem Units On Next Call

PROBLEM: SEA products may exhibit sensitivity to electrical noise coupled into the product via the AC line or any external leads exposed to radiated engine noise.

SYMPTOMS: Unit symptoms will vary, but can be any of the following:

- A) Scrambled screen
- B) Screen goes black
- C) Screen goes to 80 column mode
- D) Number of cylinders changes
- E) Optional Scope "OK" disappears
- F) Patterns displayed incorrectly
- G) Front panel LED's 9 and 10 stay on
- H) SEA locks up (no response to commands)
- I) Printer feeds paper continuously
- J) Remote Keypad stops functioning
- K) Unit locks up in "Program Loading"

ACTIONS: The amplitude of radiated or coupled electrical noise traveling on a wire or harness is greatly diminished by several loops through a ferrite carbon ring (FCR). Our general objective is to "strip the noise" off a signal or AC line by positioning an FCR on the input lines as close to the noise source (or back panel for internal harnesses) as possible or practical. Two additional MOV's installed on the fluorescent ballast lines will improve attenuation of spikes created by the ballast/starter during power-up.
(**NOTE:** Bulletins 062, 172, 173, 174, and 175 dealt with correction of shielding/ grounding problems. A description follows of simple modifications that may eliminate the need to take the drastic actions listed in SB's 172 and 174. **PERFORM THE MODIFICATIONS LISTED ON THIS BULLETIN FIRST.** If these mod's do not remedy the unit's symptoms, proceed to SB's #172 and #174.)

P/N 45763, Ferrite Carbon Ring (FCR), Installation Procedures

NOTE: Position FCR's on internal harnesses as close to back panel as possible.
Disconnect units from AC power, remove back panels, refer to figures, proceed as follows:

SEA AC Cord

- A) Insert flat plug end of AC cord through FCR 4 times. Position the FCR on the cord as close to the wall plug end as possible. Net result: 4 turns inside, 3 outside.
- B) Use two wire ties to secure the FCR to the AC cord. Reinstall cord into SEA panel.

SEA OBC Interface and Timing Light Harnesses

- A) Disconnect the following harness connectors: 934-J2, 939-J2, 945-J3, 908-J6, and the Timing Light ground line from the back panel stud.
- B) Feed all of these connectors through an FCR. Net result: 5 turns inside, 4 outside.
- C) Position FCR on harness close to back panel. Reconnect all lines as appropriate.

NOTE: If present but not used, disconnect RS232 ribbon cable from 969-J3. Leave coiled inside back panel area for future use:

SEA Boom Harness

- A) Remove boom cover. Disconnect J1 from boom board, disconnect the ground wire eyelet from boom at pipe end, lift harness out of boom front channel.
- B) Using large diagonal cutters, cut several slots in first 2 inches (5 cm) of center rib of boom-board-end of boom. Using pliers, break out the "tabs" created (fig 2).
- C) Feed boom harness through an FCR two times. Net result: 2 turns inside, 1 outside.
- D) Slide harness square rubber strain relief down 2" (5cm) on the harness, reinsert harness in front channel of boom. Position the FCR into area created by removal of the center rib section. Reconnect J1 and ground eyelet. Reinstall boom cover.

Keypad, ASC or Hard Drive

- A) Remove Floppy Drive slotted metal cover, release cable strain relief.
- B) Disconnect Keypad connector from J2 of the 1042 board and pull the cable ou unit. Leave the cable fed through the Floppy Drive metal cover.
- C) Measure a distance two feet (.7 meters) from the J2 connector, then inser connector through the FCR 5 times. The net result will be 5 inside turn outside turns at the 2 foot point. See figure 1 for example.
- D) Feed the cable back through the fan/drive assembly and reconnect the J2 conn the 1042 PCBA. Position the FCR to the left of the floppy drive so it will the cover to be reinstalled.
- E) Reinstall the Floppy Drive cover, reinstall the cable strain relief.

Fluorescent Light MOV Installation, both SEA and 13-110 Optional Scope

- A) Remove mounting screw at terminal-strip-end of ballast. Hold eyelet end o wire (P/N 45152) over mounting hole and reinstall ballast mounting screw. other end of ground wire to terminal strip as shown in figure 3. **NOTE:** T ground lead, use 8" (20cm) of 16-18ga wire and one each 15971 and 40013-1 te
- B) 110 volt applications: Install two MOV's, P/N 28937-002, as shown in figure
220 volt applications: Install two MOV's, P/N 44684, as shown in figure 4.

NOTE: For access to terminal strip, the light shield may be tipped forward by remo four mounting screws from the front panel.

13-1xx Optional Scope AC Cord

- A) Loosen AC cord strain relief, mark spade connections of AC cord, then di them from the terminal strip on the supply chassis of the scope.
- B) Feed spade terminal end of AC cord through FCR 3 times. Position FCR on the close as possible to the wall plug end. Net result: 3 turns inside, 2 outsi
- C) Reinstall spade connections on terminal strip, reinstall strain relief on co

Optional Scope Internal Harness - P/N 44114

- A) Disconnect J1 from 5000981 PCBA.
- B) Disconnect single wire of this harness (+12v line with spade) from the power
- C) Feed harness through an FCR three times. Net result: 3 turns inside, 2 outsi
- D) Reconnect +12v single wire to relay, reconnect J1 connector to the 5000981 bo

SEA Auxiliary Input/Output Harness

- A) Disconnect J2 from the 5000945 PCBA, disconnect the In-Line harness.
- B) Feed both connectors through an FCR 4 times. Net result: 4 turns inside, 3 o
- C) Position FCR on harness close to back panel. Reinstall connectors.
Reinstall back panels.

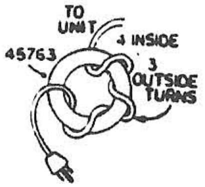

Figure 1

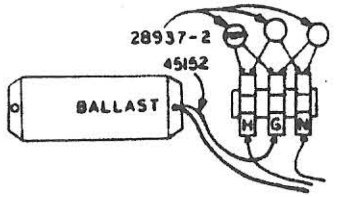

Figure 3 (110 volt)

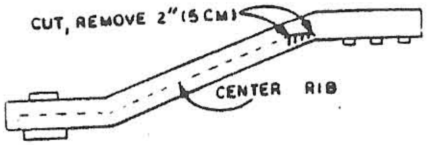

Figure 2

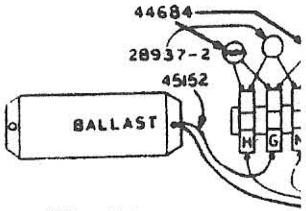

Figure 4 (220 volt)